International Journal of Theoretical Physics 2017, pages 1-12

On τ-Compactness of Products of τ-Measurable Operators

Bikchentaev A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2017 Springer Science+Business Media New YorkLet (Formula presented.) be a von Neumann algebra of operators on a Hilbert space (Formula presented.), τ be a faithful normal semifinite trace on (Formula presented.). We obtain some new inequalities for rearrangements of τ-measurable operators products. We also establish some sufficient τ-compactness conditions for products of selfadjoint τ-measurable operators. Next we obtain a τ-compactness criterion for product of a nonnegative τ-measurable operator with an arbitrary τ-measurable operator. We construct an example that shows importance of nonnegativity for one of the factors. The similar results are obtained also for elementary operators from (Formula presented.). We apply our results to symmetric spaces on (Formula presented.). The results are new even for the *-algebra (Formula presented.) of all linear bounded operators on (Formula presented.) endowed with the canonical trace τ = tr.

http://dx.doi.org/10.1007/s10773-017-3318-6

Keywords

Elementary operator, Hilbert space, Integrable operator, Linear operator, Normal semifinite trace, Rearrangement, Von Neumann algebra, τ-compact operator, τ-measurable operator